

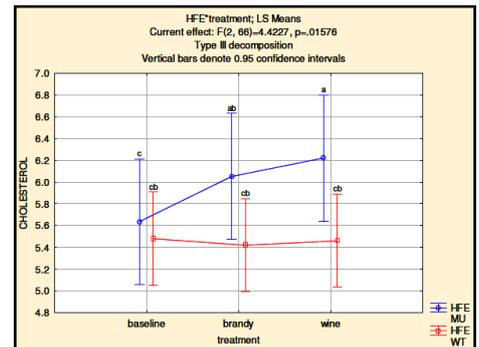


Local Research News

Alcohol consumption interacts with genetic risk factors

The effect of regular moderate alcohol consumption in the form of red wine or brandy was investigated on the lipoprotein profile, oxidative stress status and inflammatory markers in 37 volunteers. These physiological effects were assessed in relation to genetic risk factors for cardiovascular disease. Half of the participants consumed 250 / 175 ml red wine per day x 28 days, and the other 50% consumed 50 / 40 ml per day brandy x 28 days, respectively for men and women. This was followed immediately by a cross-over period of wine or brandy consumption for 28 days.

The most significant finding related to the response in the lipid profile was that both the wine and brandy intervention resulted in a significant increase in HDL ('good') cholesterol, which is known to have a cardiovascular protective effect. The increase in total cholesterol levels observed after the alcohol intervention was only found in individuals with the C282Y and/or H63D mutations in the HFE gene (blue line right, red line is other individuals). An increase of triglyceride levels was observed with alcohol intake, which was only seen in HFE mutation-positive individuals. The level of total glutathione, an antioxidant, was significantly decreased after the brandy intervention, while the wine intervention did not cause any significant decrease. It was concluded that nutrition intervention may be more effective than alcohol for lowering cardiovascular risk when the individual's genetic background is taken into consideration. www.sawislibrary.co.za/dbtextimages/vanVeldenD.pdf



Enzyme-secreting yeasts

While some wine yeasts have the genetic potential to secrete enzymes of oenological interest, the impact of these enzymes is poorly understood and their secretion rates are limited. For this reason winemakers add enzymes during alcoholic fermentation. These added enzymes mostly break the network of grape cell walls in order to release more aromas and also to facilitate filtration and clarification. A project investigated the improvement of enzyme secretion by wine yeasts during alcoholic fermentation in order to reduce or even eliminate the addition of commercial enzymes.

The endo-polygalacturonase-encoding gene of *Saccharomyces cerevisiae* was successfully reintroduced in strains naturally lacking this gene and therefore lacking pectinase activity. The endo-polygalacturonase encoding gene from *S. paradoxus* displayed a few minor differences in its sequence when compared to that of *S. cerevisiae*, but *S. cerevisiae*'s enzyme was marginally better adapted to winemaking conditions. A β -glucosidase gene was recovered from *Candida oleophila*, but it was not clear whether this gene is secreted. Two protease-encoding genes from *Metschnikowia pulcherrima* and *Candida apicola* were retrieved and partially characterised. These two enzymes seem to be active at the pH and temperatures in wine fermentation, and look very promising. The project was also concerned with the optimisation of genomic DNA libraries and metagenomic libraries. www.sawislibrary.co.za/dbtextimages/Bauer.pdf

International Research News

Resveratrol may counteract cardiovascular benefits of exercise in older men

The first evidence that resveratrol supplementation may have negative effects on training-induced improvements in cardiovascular health adds to the growing body of evidence that questions the positive effects of resveratrol supplementation. The study suggests that older men who consume high levels of the polyphenol (found in grapes and red wine, but also sold as supplements) may block the beneficial effects of exercise, which include reducing blood pressure and lowering cholesterol.

A group of 27 healthy, physically inactive men around 65 years old were studied for 8 weeks. All of the men performed high-intensity exercise training and half of the group received 250 mg of resveratrol daily, whereas the other group received a placebo pill. While exercise training was found to be highly effective in improving cardiovascular health parameters, resveratrol supplementation decreased the positive effects of training on several parameters, including blood pressure, plasma lipid concentrations and maximal oxygen uptake. The quantities of resveratrol given in the research study were much higher than those that could be obtained by the intake of natural foods. <http://dx.doi.org/10.1113/jphysiol.2013.258061>

Pulsed electric field treatment of red wine

Phenolic compounds largely determine the colour, the taste and the aging properties of red wines. Phenolic compounds are mainly located in the grape skin and are difficult to extract under normal winemaking conditions. Numerous studies have focused on prefermentative techniques able to weaken the cell walls and so to increase the phenolic concentration in red wines during vinification. These include thermal treatments, which however, involve high energy consumption and can degrade

the product quality. Now the effect of pulsed electric field (PEF) treatment on the cold maceration (6 days at 6°C) of Cabernet Franc (CF) and Cabernet Sauvignon (CS) grapes has been investigated with the aim of increasing the phenolic concentration.

pH, °Brix, colour intensity, anthocyanins and total polyphenols, and free radical scavenging activity were determined during the whole period of cold maceration. The application of high (5000V/cm) and moderate (400 and 800 V/cm) PEF treatments enhanced the colour intensity, increased the anthocyanin content and accelerated the extraction kinetics of phenolic compounds. The high PEF treatment (5 000V/cm, duration 1 ms, 48 kJ/kg) significantly enhanced extraction of flavonoids (quercetin 3-β-D glucoside and epicatechin gallate) after the cold maceration of red grapes. This PEF treatment also enhanced the colour intensity (by 75% and 68% respectively for the CF and CS grapes), and increased the anthocyanin content of extract (from 87 to 172 mg/L for CF and from 168 to 269 mg/L for CS grapes). The moderate PEF treatments (400 and 800 V/cm, duration 50 to 100ms) were less effective for polyphenol extraction, but consumed less energy. The PEF treated samples significantly inhibited free radical scavenging activity. <http://dx.doi.org/10.5344/ajev.2013.12098>

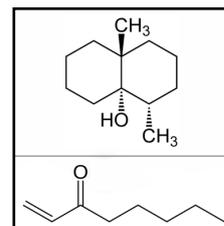
The perception of phenolic character in white wine

White wines vinified in ways that produce higher phenolics tend to be more bitter and astringent. However, higher phenolic concentrations in white wines also enhance palate fullness in white wines. To evaluate the in-mouth perception of textures of white wine arising from the interactions between white wine phenolics, pH and alcohol level, phenolics were extracted from white wines. They were then added back to white wines that were adjusted to different pH and ethanol concentrations within wine realistic ranges.

Phenolics contributed to the perception of astringency, hotness, viscosity and bitterness in white wine. Hotness and bitterness also depended on both pH and ethanol concentration. Adding phenolics to a white wine at pH 3.3 significantly increased its astringency, but the same addition did not contribute to the higher astringency elicited by the same wine when adjusted to pH 3.0. Higher phenolics generally increased bitterness and viscosity, but the effect depended on the source of the phenolics. Wines with added phenolics were generally perceived to be hotter, and significantly so when the wine was low in alcohol. The observed effects of adding ethanol indicates that ethanol contributes directly to the tastes and textures that are normally attributed to phenolic content, so ethanol contributes significantly to white wine style. Overall, the tastes and textures produced by white wine phenolics were more pronounced in wines with lower alcohol levels. <http://dx.doi.org/10.5344/ajev.2013.13016>

Evaluation of treatments to remove earthy and fresh mushroom off-flavours

Geosmin (right, top) is responsible for a distinctive earthy flavour and the human nose is able to detect it at concentrations as low as 5 parts per trillion. 1-octen-3-one (bottom right) has a strong metallic mushroom-like odour. Several products are available to remove these off-flavours from wine. A number of these products have been evaluated in terms of their efficiencies of removing these odours from white wine. The products included activated carbons, chitosans, zeolites and filtrations. For each product, different doses were evaluated on wine spiked with 200ng/L of geosmin or 1-octen-3-one. Deodorizing activated carbons may be recommended for the removal treatment since they showed different abilities to remove these two off-flavors, with efficiencies ranging from medium to very high. Filtrox TX-R filtration was able to remove all the geosmin present. Zeolites were not sufficiently efficient, and neither was chitosan. As for fining, preliminary tests must be performed by the winemaker in order to determine the optimal dose of the treatment. No sensorial assessment was done after the treatments. <http://dx.doi.org/10.5344/ajev.2013.13061>



Other news

Mycotoxin detection device to go from prototype to production

Mycotoxins are often resistant to decomposition and as such can remain in the food chain, posing a threat to important sources of human nutrition. Traditional methods of detecting toxins in food products are often unreliable and are costly and time-consuming. Now a collaborative venture has developed a novel device able to perform rapid detection and quantification of ochratoxin A (OTA) - a highly toxic strain of mycotoxin - in wine, beer and feed through a linear array of photosensors deposited on a glass substrate. The next step consists in making the transition from the prototype compact portable device to a commercial device. The recently-launched DEMOTOX project aims to do just that, preparing a range of devices ready to be introduced into the commercial market within the next 2 years. <http://phys.org/news/2013-08-mycotoxin-device-prototype-production.html>

Wine apps

Delectable is an iPhone application for remembering wines you've tasted and for discovering new vintages. Image recognition technology identifies the wine from a picture you take of the bottle. You can tag friends, add locations, assign ratings, and make notes. Delectable has over 2 million bottles in its database, and this number is rising. It has personalized wine recommendations and comprehensive profiles for wines. There is also an explorable map so users can visualize the origins of their wine choices and the areas producing wines they are likely to enjoy. Social features let users follow friends and engage with other oenophiles. Other wine apps on the market are Vivino, Snooth, Club W and Lot18.

<http://venturebeat.com/2013/08/21/delectable-brings-cutting-edge-tech-to-ancient-pursuit-of-wine/>

Winetech Scan is available on the Winetech website www.winetech.co.za

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